Volume 138, Number 30

Thursday, November 29, 2018

Provost provides updates on College of Computing plans

Sites along Vassar Street emphasized for new building

By Jessica Shi

Provost Martin Schmidt PhD '88 provided an update on the planning process for the Schwarzman College of Computing at the faculty meeting Wednesday.

Schmidt said he expected that the search committee for the college's inaugural dean, which is chaired by Institute Professor Ronald Rivest, would provide a list of candidates this week. A number of candidates on the list will then be selected for an interview.

Several viable sites for the new building, which has an anticipated completion date of 2022, have also been identified and presented to the Academic Council and some members of the faculty Committee on Campus Planning, Schmidt

Schmidt did not elaborate on specific locations under consideration, instead only mentioning that the sites that have attracted the most attention are those along Vassar Street.

Associate Provost Krystyn Van Vliet PhD '02 added in an email to *The Tech* that this area is "proximal to most of MIT's research and teaching activities."

Van Vliet further clarified that "the region of campus appears clear whereas the specific site remains under discussion," and declined to share potential sites, claiming that this can be "confusing and alarming" if done prematurely.

As for whether the construction would happen on an empty site or involve the tearing down of an existing building, Van Vliet wrote, "Few sites on the current MIT campus are truly empty, given our decades of growth and change, and thus the siting of the new college will certainly include reconfiguration if not removal of an existing building on

The bulk of Schmidt's update focused on outlining the five working groups that are currently tasked with developing ideas and recommendations for the college and its future

One group considers "the organizational structure that enables us to accomplish the mission of the college," Schmidt said. Questions to be answered include whether the college will consist of departments, sections, or other units.

Schmidt commented that it is "likely that it makes sense" to have a department of electrical engineering within the college.

A second working group addresses faculty appointments, especially regarding the "bridge" faculty who will hold joint appointments across departments.

Schmidt said the group will look at what has and has not worked with faculty who currently hold joint appointments, as well as "the various ways faculty already on this campus ... might participate in the college."

The college expects to hire 50 new faculty, including 25 bridge faculty, over the course of approximately five years, according to the FAO published by MIT News.

Another group focuses on degrees, particularly dual degree programs, and courses, particularly courses that are developed within the college but are broader ranging.

Schmidt said that historically, it has taken about a year to develop each existing dual degree program, and he estimated that there are at least 25 units at MIT that would be interested in creating new ones.

The emphasis here is "not faster. but more," Schmidt said — that is,

Computing, Page 2



A team works on final preparations for their project before the start of the MIT Museum's Friday After Thanksgiving Chain Reaction event in Rockwell Cage Nov. 23.

IN SHORT

Pre-registration for spring term opens Monday, Dec. 3 at 9 a.m. The deadline to initiate preregistration is Dec. 27 at 5 p.m.

Winterfest, a holiday-themed study break, will take place today from 3:30-5 p.m. on the first floors of Stata and the Koch

Stop by the UA's Tech Twinkles **event** today from 7–9 p.m. in Lob dell for the annual tree lighting, performances, treats, and mugs.

PE registration for IAP is open until Wednesday, Dec. 5 at 1 p.m. Graduate students can register beginning Tuesday, Dec. 4 at 8 a.m. Sign-ups are first-come, first-served.

Interested in **joining** *The Tech*? Email join@tech.mit.edu.

Send news and tips to news@

Chinese scientist claims recent birth of first gene-edited babies

CRISPR co-inventor Feng Zhang calls for moratorium

By Jordan Harrod

STAFF REPORTER

On Sunday, Chinese scientists at the Southern University of Science and Technology announced via You-Tube that the first pair of gene-edited babies had been born.

Led by He Jiankui, the team of researchers had recruited couples for a study where CRISPR-Cas9 was used to eliminate a gene called CCR5 in human embryos before implanting them into women using in vitro fertilization (IVF). CCR5 codes for a receptor used by the HIV, smallpox, and cholera viruses to infect host cells. Jiankui hoped that the elimination of this gene would result in

resistance to these viruses in the

In the video, Jiankui announced that one of the couples had successfully become pregnant, and had given birth to twin girls earlier this month. He declined to identify the couple or the region in which they reside, and the success of this study has not been independently confirmed. The study was carried out secretly, with the MIT Technology Review and The Associated Press breaking the news this past

This announcement prompted significant backlash from the global scientific community, especially in light of the fact that it was released hours before a global geneediting summit in Hong Kong that aimed to discuss how such technologies would be governed. Many scientists condemned Jiankui's work, calling it unnecessary, given current preventative measures for HIV, smallpox, and cholera, and reckless, as gene-editing can cause off-target effects that are difficult to predict and have significant developmental consequences.

Researchers at the Broad Institute released statements on Monday in opposition to Jiankui's work. Feng Zhang, a molecular biologist who pioneered the usage of CRISPR in eukaryotic cells, noted, "Although

Individual who suffered medical emergency Mon. in Infinite has died

The person who suffered a medical emergency in the Infinite Corridor on Monday has died, Kimberly Allen, director of media relations, confirmed in an email to *The Tech* Wednesday.

"MIT Police and paramedics with the Cambridge Fire Department responded to reports of an individual in need of medical attention in the Infinite Corridor. The individual, who was on campus as a subcontractor, was transported by ambulance to a hospital where, police have learned, he later died," Allen wrote.

The Tech observed that the area of the Infinite near Building 8 was blocked off at around noontime Monday for about an hour.

Bryan Padilla '22 wrote in an

email to The Tech that he came across the individual lying in the hallway and stopped to try and help, along with a few others.

"I asked the gentleman he felt and he just said 'dizzy," Padilla wrote. When his condition worsened, Padilla asked someone to call 911.

Allen listed resources available to those seeking comfort or guidance, including MIT Mental Health and Counseling, Student Support Services, Graduate Personal Support, the Graduate Assistance and Information Network, MyLife Service (for faculty, staff, and postdocs), Dean on Call, and the Office of Religious, Spiritual, and Ethical Life.

— Jessica Shi

MIT Title IX issues statement responding to DeVos policy

Sarah Rankin, MIT's Title IX coordinator, released a statement Tuesday affirming that its commitment to "providing vital support resources" will not change, in response to Secretary of Education Betsy DeVos's proposed policies regarding college sexual

The MIT Title IX Office is currently reviewing the draft of the regulations and determining how MIT's policies could be affected, as well as any action MIT should take.

The proposed policies would narrow the definition of sexual assault to which colleges must respond, making the standard "unwelcome conduct on the basis of sex that is so severe, pervasive, and objectively offensive that it effectively denies a person equal access to the school's education program or activity."

Currently, colleges must respond to any "unwelcome conduct of a sexual nature," as per Obama administration's guidelines.

'We will continue to administer a fair, impartial, and transparent complaint-handling process to all parties involved in sexual misconduct cases," the statement

— Zoe Anderson

BETTER BATTERIES

The Electrochemical Materials Lab hopes to optimize energy storage using materials science. SCIENCE, p. 5

WOULD YOU EAT THAT?

Weird food combinations. CAMPUS LIFE, p. 4

YOUR NARCISSISTIC AUNT

Auntie Matter talks about herself. CAMPUS LIFE, p. 4



OUTCASTS STICK TOGETHER

A heart-wrenching film about shoplifting and family. **ARTS, p. 7**

TOD MACHOVER TALKS SCHOEN-BERG

MIT Media Lab professor composing for an opera. ARTS, p. 8

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WEATHER

Cold, wet, and rainy. Again.

By Kyle Morgenstein

After a record-breaking wildfire season, California finds itself drenched in much needed heavy rains this week, with precipitation extending across the West Coast. The Midwest and Southeast are also seeing widespread rain which will hit us on Sunday. This fall has been one of the wettest in recorded history for Boston, and that trend

continues into this weekend with showers predicted throughout the weekend. While skies should clear briefly on Thursday and Friday, be prepared for off and on showers from Saturday evening on. This has shaped up to be the 4th wettest fall and 3rd wettest November since records have been kept. Fingers crossed for a good snow season, and bundle up going into December!

Extended Forecast

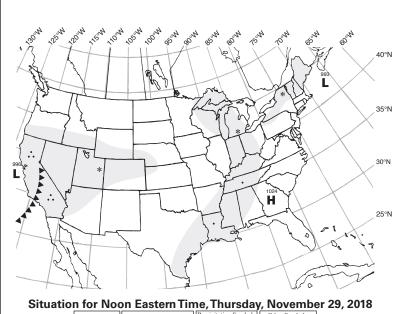
Today: Partly cloudy with 16 mph winds coming out of the northwest. High of 43 °F (6 °C).

Tonight: Expect temperatures to flirt with freezing. Partly cloudy with 14 mph winds headed SE.

Tomorrow: The skies should clear for most of Friday before the clouds return in the evening and persist through the weekend.

Saturday: Mostly cloudy with a 40 percent chance of rain in the evening. Temperatures will stay in the mid to upper 30s, peaking at 42 °F (6 °C).

Sunday: Sunday will be warmer at 52 °F (11 °C) but should be overcast all day with a 50 percent chance of rain.





Faculty chair Silbey: college satisfies 'practical need'

Computing, from Page 1

sufficient "bandwidth" is required to create these programs without sacrificing the value of a careful, extensive process.

The fourth group Schmidt listed studies how to integrate emphasis on the "social implications of computing" into the fabric of the college, such as by finding new types of faculty who can meet these goals and developing ethics courses.

A fifth group looks at "computing infrastructure": how to ensure departments have the information and resources they require to do what they need to computationally, such as methods of accessing and storing data.

During the open discussion that followed Schmidt's remarks, Professor Yossi Sheffi PhD '78, director of the Center for Transportation and Logistics, commented on what he perceived to be a lack of the clarity about what the college would be able to accomplish that cannot already be accomplished with existing infrastructure.

"We go through such a large endeavor with such fuzzy ideas about what's going on," Sheffi said. "I'm trying to understand the need."

Professor Susan Silbey, chair of the faculty, said in response, "It's not necessarily an abstract, logical need. It's a practical need."

Soomin Chun contributed reporting.

Broad Inst. scientists relay risks of gene-editing embryos

CRISPR, from Page 1

I appreciate the global threat posed by HIV, at this stage, the risk of editing embryos to knock out CCR5 seems to outweigh the potential benefits, not to mention that knocking out CCR5 will likely render a person much more susceptible for West Nile Virus." In the statement, Zhang called for a "moratorium on implantation of edited embryos ... until we have come up with a thoughtful set of safety requirements."

David Liu, director of the Merkin Institute for Transformative Technologies in Healthcare at the Broad Institute, conveyed similar concerns, calling the development "a serious breach of ethics that I hope will serve as a wake-up call for the community" and noting that "there may be a future in which embryo editing is justified following a careful analysis of potential benefits, risks, and ethical issues, but the recently reported work does not meet these standards"

In contrast, George Church of Harvard University defended the study in a comment to the AP, calling it "justifiable" in the face of the growing threat of HIV. Jiankui defended the study using a 2017 gene-editing report from the U.S. Academies of Sciences, Engineering, and Medicine, which stated that gene-editing could be performed to prevent serious illness. However, the U.S. Academies are not a regulatory organization, only providing guidelines for responsible conduct of research. The U.S.

Academies released a statement on Tuesday affirming the recommendations made in their 2017 report.

The Southern University of Science and Technology has publicly stated that Juinkui's work violates academic ethics and standards, and plans to investigate the work. The Shenzhen City Medical Ethics Expert Board also plans to investigate. Jiankui stood by his work in a statement to the AP, stating that "I believe this is going to help the families and their children."

CORRECTIONS

In last week's print issue, an article about the play WET: A DACAmented Journey incorrectly referred to Alex Alpharaoh as Anner Cividavis, which is his given name but not the name he goes by.

Some updates have been made on *thetech.com* to the article "Understanding disease at the Nanoscale," to more precisely describe the science and technology involved in the research at the Nanomechanics Laboratory.

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THURSDAY, NOVEMBER 29, 2018 THE TECH 3

Students share thoughts, concerns on new **College of Computing**

Some note that no additional information has been actively shared with students since initial Oct. 15 announcement

By Joanne Yuan

The new Schwarzman College of Computing, which is expected to open in September 2019, has elicited mixed reactions from students, who recognize its potential to expand computing opportunities while also noting the lack of detailed information that has been released since the original announcement.

At the student forum on the College of Computing held Oct. 25, several audience members raised questions regarding how the college will approach diversity, and MIT's mission and relationship

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with donors. According to MIT News, the administrators at the forum responded with agreement with regards to diversity, and stated that MIT had practiced "due diligence" during the creation the college's name.

Thomas Sierra '22, who plans to study Course 3, said in an interview with The Tech that he believes that the college will help fulfill the demand for computer science majors in the workforce.

Aaditya Singh '21 similarly told The Tech that the college is valuable because "in the future, there's going to be a much more computational presence in all applications."

As a Course 6 and Course 9 student, Singh said that he noticed the prevalence of computer science in his neuroscience classes, which require the use of MATLAB and involve time series analysis for neural recordings.

"I'm excited to see what things it leads to and what discoveries are made by researchers in the college of computing," Singh said.

Many details about the implementation have not yet been announced, but both Singh and Sierra said that they are excited about the interdisciplinary aspects; Sierra is particularly interested in combining computer science with his interest in material science.

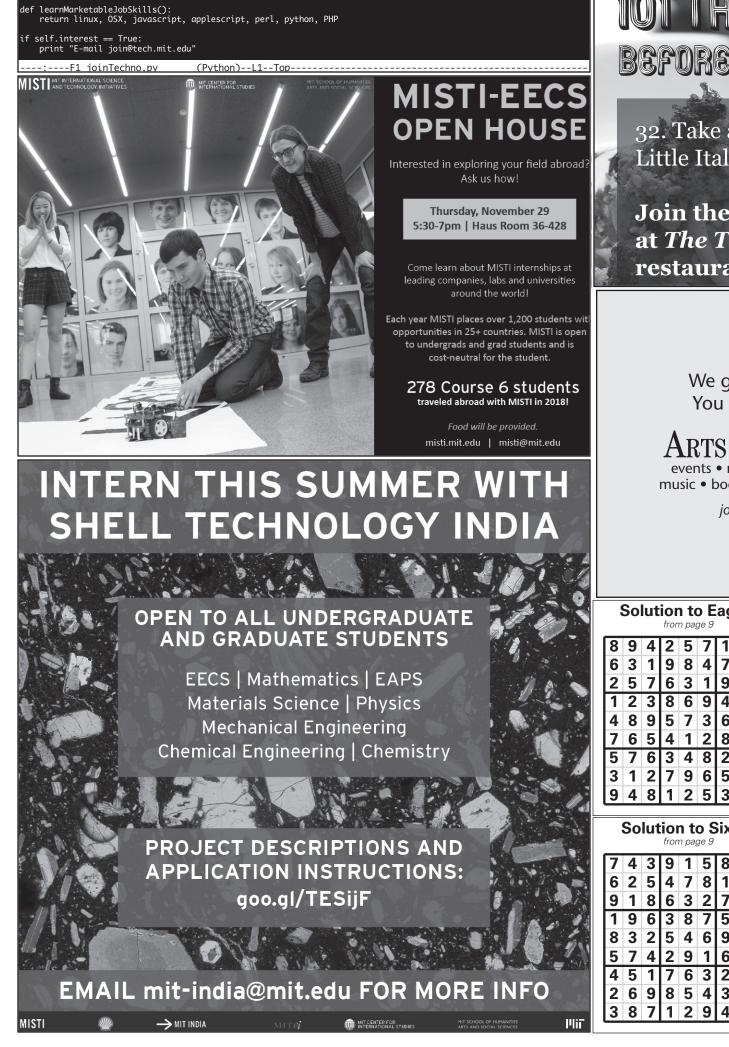
Munachimso Nwana '22 told The Tech that he believes that the college may be valuable to the numerous Course 6 majors in MIT, however, he said he does not foresee it having a significant effect on his own plans to study business analytics.

However, Nwana also commented on the lack of specific information available, stating that he had not received additional information since the Oct. 15 email from President L. Rafael Reif announcing the creation of the college. Emma K. Batson '22 concurred, commenting, "I don't think anyone knows

any of the details of this," in an interview with The Tech.

Batson does, however, support the sentiment behind the initiative: "I think that all majors should have more opportunities to learn about how to take these new tools and problem-solving skills into their own majors. And that's what I'm hoping the new College of Computing will do." Batson also hopes that the changes will make administration for Course 6 easier.

"In general, I think it's the right move; specifically, whether or not it's the right move, [I have] yet to say. That depends on implementation details," Batson concluded.



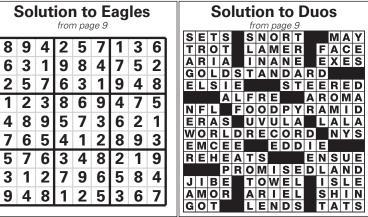


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Solution to Sixers

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Nine weird food combinations in my life

Who says pasta and ketchup don't go together?

By Tafsia Shikdar

STAFF WRITER

Sometimes, a poor college student just has to put the things in their cupboard together. Other times, you realize you just had a weird childhood.

- 1. Green beans on buttered toast. I got this from a senior on my floor. Simple, quick, and surprisingly satisfying.
- 2. Peanut butter, sliced bananas, and Hershey's sauce on a bagel/rice cake/toast. In theory, the flavor combination is fine. My roommate just thinks I use Hershey's syrup too much (as evidenced by the Hershey's drizzle on the ice cream cake I made for my birthday, and the next number in this list...).
- 3. Using Hershey's syrup in s'mores. My roommate may have a point, but actual chocolate is expensive. As long as you have the cracker/marshmallow/chocolate flavor combo, what's the issue?
- 4. Peanut butter and jelly bagel. I think this is totally normal, but Southerners have looked at me in disgust a few times. Apparently, anything other than cream cheese is blasphemy.
- Peach froyo with bursting mango boba. Wasn't bad...but the question is, was

it good? Courtesy of Cafe 472 (well, I bought it from them. Not sponsored.)

- 6. Pizza sauce on toast. I feel like pizza bagels are acceptable, but I didn't have a bagel...What's one carb for another?
- 7. Warm milk in cereal. So this is definitely a British thing, made popular (I think) by Coco Pops (basically chocolate Rice Krispies) advertisers. At least, I remember seeing it in TV adverts when I was younger. The perfect solution for when someone says they don't want cereal because they want "a hot breakfast."
- 8. Pasta with ketchup. My brothers and I add tomato ketchup on top of our pasta, and this is a totally normal thing within our family. This is after my mum has cooked it with the normal sauce and veggies. Especially after reheating, when the pasta has become a bit dry, it's a perfect rejuvenation technique. Thoughts?
- 9. Chicken and waffles. Apparently this is widely accepted in America, but as a foreigner, it's pretty gross. I can accept fried chicken on a savoury waffle, but topped with maple syrup and icing sugar? What is it with maple syrup on savoury things? I don't appreciate my baked beans being sweet!



TAFSIA SHIKDA

The (vegan) ice cream cake I made for my birthday last year. I think the Hershey's drizzle was a perfect addition.

ADVICE

All about Auntie

Auntie Matter on herself

By Auntie Matter

If you have questions for Auntie Matter, please submit them at tinyurl.com/AskAuntieMatter.

Auntie's readers have long expressed to her that they would like to know more about the mysterious entity behind everyone's favorite weekly sage advice column. Therefore, Auntie will indulge her more narcissistic tendencies. You're welcome, readers.

If you would like Auntie to return to actually giving advice, please submit more questions! Otherwise, expect a full column next week of Auntie's favorite recipes, including her favorite six-ingredient Swedish chocolate cake. She recommends browning the butter before adding it to the batter, even though this recipe does not call for this.

Dear Auntie Matter,

If you could relive your years as an undergrad at MIT, what would you do differently? — A Curious Reader

Dear Curious,

Given the chance to go back in time, there are things Auntie wouldn't repeat, but she doesn't exactly regret any of her decisions. There is nothing (except for working at a certain summer program

which will remain nameless) that Auntie feels was simply the wrong decision. She could not have learned from her mistakes without making them, and it's not clear that erasing them would be the best course of action.

That said, there are a few things she wishes she knew as a freshman:

- Do not write in pen in your copies of philosophical works. Senior you will not find freshman you's commentary very enlightening.
- You do not need to work the whole summer if you are travelling for pleasure, spend as long as you can there, even and especially if it means taking an extra week off of your summer internship. IT REALLY DOESN'T MATTER.
- Attend that 10 a.m. class, or you may have to drop and repeat it. Twice.
- If eye contact is not a challenge for you, UPOP may not be the best use of your time.
- When your summer internship program requires you to write a 20-page policy paper over the summer, you should actually do so during the summer months as opposed to waiting until October when it is due.
- Before you take on a UROP where you have to do brain surgery on rodents

and/or kill them in ways that are almost comically gruesome, meditate on your suitability for such a job. Furthermore, investigate the social climate of any workplace you are considering joining — you may be (unpleasantly) surprised.

- Very high standards are appropriate in dating.
- If you struggle to eat enough, full-fat dairy is your friend. Perhaps even if you do not have this problem, full-fat dairy is your friend. It tastes better. There, Auntie said it.

Lightning round: now Auntie will answer a few short questions about herself.

What are your favorite Central Square restaurants?

Auntie's two top picks are Asmara, an Eritrean and Ethiopian restaurant, and the Rangzen Tibetan Place (especially the lunch buffet). She recommends the vegetarian combination for two at Asmara and the veggie momo at Rangzen.

What are your dating deal-breakers?

Dreadlocks on white men, people who talk about Marvel movies for the entire first date, people who are too clingy, people who are not clingy enough, people who say they "don't read," rationalists, picky eaters, anti-GMO sentiment,

cigarette addiction, and patchy facial hair (just shave!).

What do you look for in a friend?

"Complete friendship is the friendship of those who are good and alike in point of virtue, ... yet friendships of this sort are likely to be rare, since people of this sort are few." (Aristotle, *Nicomachean Ethics*, VIII.3.7-26, trans. Bartlett & Collins).

What is your favorite reality television

Auntie is so glad you asked this question! She is an avid viewer of MTV's 16 and Pregnant. Auntie has learned so much from the show: it reminds her each episode what an epidural is, what pitocin is, and confirms to her that she was sensible in getting an IUD. No pregnancy scares for Auntie! It also taught her this sage lesson: those least qualified to be teen parents are the most likely to become teen parents.

What do you look for in a vacation spot? Infinite delicious Turkish breakfast, pleasant ferry rides on the Bosphorus, friendly locals who offer to drink tea with you, weekend trips to Ephesus (look for Ali, the shoe merchant, in the nearby town of Selçuk), cheap fresh-squeezed orange juice, and beautiful Islamic architecture. Auntie also enjoys visiting places that aren't Turkey.

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LAB SPOTLIGHT

The next generation of materials

The Electrochemical Materials Lab aims to develop the multifunctional materials of the future

By Jordan Harrod

STAFF WRITER

Scientists and industry leaders alike have hypothesized that we are reaching the limits of our ability to design faster computational systems using traditional hardware like transistors. While quantum computing is a tantalizing solution to this problem, the technology is not yet ready for the hands and pockets of the average consumer. Jennifer Rupp, Professor of Materials Science, Electrical Engineering, and Computer Science and Principal Investigator of the Electrochemical Materials Lab, is working to develop new materials that bridge this technology gap for the average person. The Electrochemical Materials Lab focuses on finding new ways to process ceramic and glass, leveraging new methods and design paradigms towards new device functionalities that have the potential to make our devices smaller, faster, and smarter than ever

When Rupp was 17, she found herself extremely interested in how atoms and chemistry create crystal structures. Classically trained in mineralogy and crystallography, she was "always very amazed" by the "high variety of properties defined by crystal structures," and gravitated towards materials. "It was a natural given to go into ceramic processing and properties of materials, and thinking about what that can define for the next era of devices," she recalled. As Rupp focused increasingly on ceramics and device engineering, she began looking for ways to develop more efficient batteries and the next generation of computational

devices. To this end, she joined MIT and established the Electrochemical Materials Lah

What makes the batteries developed in the Electrochemical Materials Lab different from the ones in our phones and laptops? According to Rupp, it's the flammability of the material. "If you opened your battery, it would flame, or cause irreparable damage. But if you have the lithium encapsulated in a ceramic structure, even if you open the battery casing, it will not enflame." In other words, ceramic structures would make batteries much safer for the average consumer. Rupp also notes that ceramic's durability would allow batteries to run at higher voltages that would corrode conventional laptop and phone batteries. "Using these higher voltages would allow devices to be charged faster and potentially store more energy, extending the lifespan of consumer electronics."

Ceramic structures would make batteries much safer for the average consumer.

In addition to increasing the voltage at which batteries can run, Rupp is also interested in expanding the functionality of batteries towards sensing technology. "Currently, in your phone, you have your battery that supplies the energy, a couple of sensors that track your motion, temperature, and a couple other things, and a couple of processors computing the data," Rupp explained.

"What I'm also working on is having one base material for the hardware with different electrochemistries for energy storage, environmental monitoring, and data computation." In this way, Rupp hopes to optimize the amount of materials used in phones and laptops while also increasing function.

Scaling the processing and manufacturing of a material to maintain its useful properties can be a challenge.

The lab has already made strides towards developing batteries with environmental sensors. They recently published a paper in Nature Materials showing the use of a solid state battery, which is a fast conductor, to track the carbon dioxide levels in a room in real-time at very low temperatures. This sensor-battery hybrid can be used to determine the number of people in a given area, potentially feeding into a climate control system that would result in efficient energy usage and real-time temperature control in any space. While the battery only senses carbon dioxide at the moment, the lab is has begun research on expanding this technology towards sensing other relevant chemicals.

Though progress has been made, the work of the Electrochemical Materials Lab is not without challenges, especially when looking to preserve a material's properties after processing it to create a product. Ac-

cording to Rupp, "Process defines properties." The lab often discovers or knows of exciting properties of materials that have the potential to be used for novel devices. but scaling the processing and manufacturing of that material in a way that maintains those properties can be a challenge. Rupp welcomes this challenge. She believes that scientists, in addition to doing basic research, should make an effort to understand how their work can be made accessible to society. "When I started at MIT, I think I was doing more conceptual and fundamental work, and I think MIT gave me the wings to be courageous, to think about how we can translate our work back to the public." In pursuit of this, Rupp and her students make ethically conscious decisions about the research partnerships that they choose to enter, being sure to foster collaborations that will make their work accessible to the greater public.

In addition to bringing her own research to the public, Rupp is interested in showing other academics that they do not need to work solely within their own field. She wants to foster interdisciplinary research on electrochemical materials development to increase the potential uses for a given device. Rupp also wants to make mass energy storage cheap and accessible, so that a broader mass of people can access resources such as electric cars. In Rupp's eyes, the future of electrochemical materials is "challenging, exciting, and good." By working to make accessible, efficient technology, the Electrochemical Materials Lab hopes to brighten the future of energy for the average person.

SCIENCI



6 THE TECH Thursday, November 29, 2018

CONCERT REVIEW SARTSARTSARTSART

Dun-dun-dun DUUUUUN!

Beethoven takes the (whole) stage at BSO

Week 7: Beethoven's Symphony No. 4 in B-flat, Beethoven's Symphony No. 5 in C minor

Performed by the Boston Symphony Orchestra

Conducted by Andris Nelsons

Boston Symphony Hall Nov. 23, 24, 27

By Erica Weng

STAFF WRITER

BSO continues its 2018-19 season under the fantastic dramatism of director Andris Nelsons, with the fantastic dramatism of cue dun-dun-dun-DUN... Beethoven! This all-Beethoven concert featured Beethoven's 4th and 5th symphonies, an interesting juxtaposition of the famed composer's leastplayed symphony as well as his most-played symphony. Beethoven enjoyed contrasting large, heroic themes with softer, more lighthearted motifs — both on a macroscopic scale, as between adjacent symphony numbers, and on a microscopic scale, as between phrases and themes within individual movements. The 4th is one of the happier symphonies, while the 5th is more dramatic, evident in its opening notes.

Characteristic of many of Beethoven's symphonies, the 4th opens in minor, with a mysterious tip-toeing melody of lowstrings shadowed by brass. It eventually shifts to a grand celebration in a major key, reminiscent of a vibrant afternoon on the streets of Vienna or some other grand European city. Strings and timpani mark a strong rhythmic beat, while occasionally, strings and woodwinds exchange a warbling 5-note motif.

The second movement brings together a lazy but lighthearted pattern of short-long, long and short-long, short-long rhythms juxtaposed with a waltz of vibrant strings and the echo of resounding brass. The woodwind melodies flap around like a happy bird about the heads of picnickers. I give kudos to the clarinet solos for executing their melodies flawlessly — they really make the movement the winsome piece it

The third movement begins with fanfare and arpeggios that drive the piece forward at an exuberant pace. The arpeggios permeate the rest of the movement in alternating moods of cheeriness and dramatism. The final movement concludes the symphony grandly, boasting a whirlwind of strings and melodic winds interposed with fanfare from the whole symphony. At points the speedy strings were not as crisp as would be ideal, but the orchestra did a fantastic job nonetheless, bringing out the dramatic crescendos and diminuendos as wells as the sharp changes in dynamics that pervade the entire movement.

It was good that the orchestra began with the 4th symphony and concluded with the 5th, because if they began with the 5th, I may not have had enough energy to appreciate the 4th. After the unmistakable opening of Beethoven's 5th, the dun-dundun-DUN motif continues through the



Andris Nelsons leads the Boston Symphony Orchestra in Beethoven's Fourth and Fifth Symphonies.

rest of the movement. A more lighthearted motif occasionally breaks through, with strings and winds exchanging the melodic small talk of 8-note phrases, with the lower strings adding dramatic comments in the background. The small talk and all culminate in heroic brass- and timpani-dominated splendor, with the motif pervading throughout.

The second movement continues the drama with a grand, marching rhythm interspersed with the conversation between sweet-sounding winds and full-bodied strings. And of course, it wouldn't be good Beethoven without some good drama, and sure enough drama demands its fair share in

this movement in the form of an emphatic, on-the-beat rhythm the entire movement.

The 5th closes with a recurrence of the dun-dun-dun-DUN motif in a more consistent yet still dramatic form, alternating with a lighthearted race of strings executed quite well by the BSO performers. There is still some time for the melody to tiptoe around mysteriously and march around grandly before it concludes with an effusive flourish of final notes (Dun! Dun! Da-dun! DUN! DUN!) for an extra-grand

All in all, I never get tired of Beethoven's dramatic flair, and BSO pulled off quite a stellar performance of the master's work.

MOVIE REVIEW

Another disappointing remake

When Batman meets Guy Fawkes

By Nathan Liang

ASSOCIATE ARTS EDITOR

In Otto Bathurst's take on a classic tale. we get a Robin Hood (Taron Egerton) who wears military fatigues when he's a soldier in the Crusades, fighting against Muslims with machine guns disguised as gigantic crossbows. When things take a turn and Robin is forced to go back to England, he finds that his lordly estates have been confiscated by the Sheriff of Nottingham (Ben Mendelsohn). The poor are being taxed to all hell in order to fund the war efforts. To make matters worse, his former lover, Marian (Eve Hewson), is shacking up with upstart, poor-man representative Will Scarlet (Jamie Dornan).

Let's start with the things I enjoyed first: Taron Egerton and Jamie Foxx, the modern-medieval hybrid aesthetic that kinda looked cool, and the impressive (though technically questionable) archery stunts. Yeah, I think that was pretty much it.

In terms of the overall story, it's a pretty standard one. It's what most people expect from a simple movie based on Robin Hood, and that may be the cause of why Robin Hood falls short and hard. It's easy to amass the ingredients for a good movie, but it takes more than just following the recipe to make a great one. This rendition tries to create a lot of hype with its hybrid aesthetic, fast-paced training montage, and highlighting of notable talents, from Taron Egerton, who dazzled in *Kingsman*, to Ben Mendelsohn, recently notable for his role in Rogue One; but the one-dimensional feel of the plot and the flatness of

the characters don't contribute at all to improve the film.

Taking a closer look at the characters, it wasn't hard to pinpoint who the good guys and bad guys were from the start, but that provided no point of interest for the audience. Once back in Nottingham, Rob must win the favor of the Sheriff by posing as the noble Robin of Loxley by day while he works at night as "The Hood" to steal from the rich and give to the poor. He's basically Batman with the archery skills of Legolas and the mindset of the classic Robin Hood, but unlike Batman, we never really understand why Rob does what he does. He just... does it. Little John (Jamie Foxx) is a Muslim seeking vengeance for the death of his son. In training Rob to become The Hood, John is able to impede the Christian war effort by cutting off its gold supply, which works, I guess?

Then there's Marian, the only notable female character in the entire movie, but even then she feels insignificant. Sure, she tries her hand at being rebellious with Friar Tuck (Tim Minchin), but even that doesn't go anywhere without the ultimate help of Rob. Marian is a disgrace to female characters everywhere. Her assigned role the entire time is basically to create romantic tension because Rob still loves her. for some reason, and she might still love him too, despite the fact that she's with Will Scarlet, And what's up with the Sheriff of Nottingham? What are we supposed to take away from his character? Child abuse is bad because victims of child abuse grow up to become sadistic, growly adults who constantly wish for the murder of their insufferable coworkers?

Finally, there's also the problem of historical inaccuracies. I would get if they're trying to take some creative liberties with the historical setting because Robin Hood is a tale that's been done over so many times, but I wish they could make up their mind about it. The movie begins with a scene that looks like it should be set in contemporary times. Imagine any war movie that takes place in Afghanistan and replace the guns with bows and arrows $\bigstar \bigstar \Leftrightarrow \Leftrightarrow \Leftrightarrow \Leftrightarrow$

Robin Hood

Directed by Otto Bathurst

Screenplay by Ben **Chandler and David** James Kelly

Starring Taron Egerton, Jamie Foxx, Ben Mendelsohn, Eve Hewson, Jamie Dornan

Rated PG-13, Now

and that's what you get. Once Rob gets sent back to England, it's almost like he's time-traveled backwards several hundred years, but surprise! People somehow have gasoline to use and their fashion ranges from sci-fi inspired to current Fashion Week trends. At some point, people are even gambling on roulette tables since there is apparently no equivalent timeappropriate form of entertainment. The portrayal of literally anything in the movie gets confused with its intended purpose, and the choices made by the production crew ultimately feel meaningless. Perhaps the Crusades conflict is supposed to show multiplicity in our modern-day international wars, but if that's what it's supposed to be, it's not very clear.

While small portions of the movie could be enjoyable, the overall film is a mess. It's a wonder how Robin Hood was able to make it to the light of day, and I wouldn't recommend anyone wasting their time on this movie. If you want to see Taron Egerton be a badass like I was hoping for, just go and watch the Kingsman movies again.



Robin Hood (Taron Edgerton) stands before his future Merry Men.

MOVIE REVIEW

The wronged Maria Callas

Maria Callas defends her reputation in new documentary

By Ethan Vo ASSOCIATE ARTS EDITOR

Maria by Callas is an ambitious documentary in which its guiding principle acts as a double-edged sword. Aiming to debunk accusations against the late soprano of being a tempestuous diva, director Tom Volf attempts to create a narrative of the life of Maria Callas by only using sources which contain her or were created by her. These materials, some never-before-seen, include archival recordings of Callas's operatic performances, press interviews, unpublished letters written by Callas, and footage from the press and paparazzi. While Maria by Callas is successful in revealing Callas's grace and intelligence, the film's meandering direction left me wanting for a more traditional approach towards documentaries.

The documentary progresses chronologically through Callas's life with narration of Callas's letters by Joyce DiDonato, an acclaimed operatic mezzo-soprano. Most of the major events in her life are covered, including the Rome Cancellation — in which

Callas cancelled mid-performance due to contraction of bronchitis, Callas's legal separation from her husband, and Callas's affair with shipping magnate Aristotle Onassis. The overarching theme of the film is Callas's view of her identity, which she viewed as split between the ordinary "Maria," who yearns to give up her career and become a housewife, and the celebrated "Callas," the artist who accepts the events in her life as destiny.

Arias performed by Callas are interspersed throughout the film either as incidental music or presented in full, which are connected to Callas's emotional state in the milestones of her life. For example, the highlight of the film is a colorized version of her famed "Casta Diva" from Norma, in which her plea to the Goddess for Peace extends to the public outrage caused by the Rome Cancellation. "L'amour est un oiseau rebelle" from Carmen and "Vissi d'arte, Vissi d'amore" from *Tosca* similarly appear in full as reflections of her romance with Onassis as "Maria" amidst her dedication to singing as "Callas." For these reasons, the portrayal of Callas's life is insightful and thematically

Unfortunately, the imposed restriction to material from Callas's life stifles this narrative by creating a plodding pace and obscuring the film's message. Due to the lack of overarching narration, the film presents Callas's arias with little introduction, initially causing confusion as to why the film moves into song. This is also an ultimate halt in the narrative, since Callas's performances are showstoppers. The film improves in its rhythm later, but the film has already wandered through enough events, robbing Callas of agency and ascribing them to the destiny in which Callas believed.

*** Maria by Callas **Directed by Tom Volf** Screenplay by Tom Volf Starring Maria Callas, Joyce DiDonato

What truly makes the pacing issues in Maria by Callas detrimental is the choice of footage in the first half of the film. Interspersed between the chronological events is David Frost's interview with Callas, which is letterboxed and in black and white. Since I was viewing the film in a typical cinema setting, the switching of resolution and colors was disorienting due to the size of the screen. The paparazzi footage, which was already uncomfortably invasive rather than intimate, became nauseating during the section detailing Callas's legal separation from her husband. These effects exacerbated the pacing issues and made the film

Maria by Callas certainly provides an intelligent look into the singer's life with an interesting restriction. However, since almost the entire documentary is comprised of footage from over 40 years ago, much of which is already publicly available, it is reminiscent of a book report which merely quotes and summarizes the best parts; one wonders whether the merits of the organization of the report outweighs reading the book itself. In light of the presentation is sues, I would rather stick to the source.



A new documentary about Maria Callas aims to use only her own words.

MOVIE REVIEW

A family bound not by blood, but shoplifting, steals your heart

Critically-acclaimed film uncovers the struggles of a damaged and forgotten Japanese family

By Alana Chandler

STAFF WRITER

Fatherly businessmen are uniformly packed into train cars like sardines, mothers carefully place chopsticks next to a steaming dinner days on repeat, and students in crisp navy uniforms bow at right angles as the starting school chime rings. Japanese society is defined by homogeneous organization. But beneath a shell of structure pulses a harsh underworld of oppression, overwork, and exploitation. Shoplifters, a film directed by Kore-eda Hirokazu, poignantly uncovers the struggles of an oddball group of people who consider one another family, despite lacking biological relation — a son and a daughter picked off the street, a mother and a father married by crime. Acting as an ensemble piece, the film takes an intimate look into the perspective of each character.

"Husband," "wife," "grandmother," and "children" all live together in a crumbling shack-of-a-house, barely getting by on the meager salary of father-like Osamu's construction work and motherly Nobuyo's laundry job. As the title of the movie sug-

★★★★☆ Shoplifters

(Manabiki Kazoku)

Directed by Kore-eda

Hirokazu Starring Lily Franky, Ando Sakura, Matsuoka Mayu,

Now Playing

Kiki Kirin

gests, the family thrives off daily shoplifting expeditions, whether it be Osamu and makeshift son Shota's teamwork at the supermarket or Nobuyo's sneakish pocketing of items from the clothes she cleans. After a successful shoplifting mission, Osamu and boyish Shota spot a young girl, perhaps four years old, sitting alone and cold in an empty house. Noticing the scars and bruises lining her arms and the misery in her empty stare, they bring her home; soon, the young girl, Juri, is a part of their family.

Despite the littered nature of their small home, their life appears idyllic, brimming with loving moments — slurping a feast of instant ramen noodles together, splashing in the waves on a weekend beach trip, listening to fireworks they cannot see... In their cluttered but comfortable abode, they trip over one another with tenderness. laughter reverberating off the narrow walls.

Almost too good to be true, this charm begins to crumble when Shota develops concerns over the morals of shoplifting.

Soon, the dark secrets of the family are revealed. From the teenage daughter Aki's soft-porn sex work to the grandmother's addiction to pachinko machine gambling, the impoverished innocence of each character begins to shatter. Although the audience is watching a family comprised of what society considers the bottom of the barrel - those who leech off others without contributing anything — the audience cannot help but cheer them on through their struggles. Juri's childhood neglect and domestic abuse, the harsh working conditions experienced by the parents, and the sexual exploitation of young girls are some examples of nuanced details that bring to life issues often overlooked in Japan.

This family acts as a microcosm of society; from the surface, they appear to live a structured life, yet behind the curtains lays the tale of damaged outcasts. When the family takes Juri into their home, is it an act



COURTESY OF MAGNOLIA PICTURES

Nobuyo (Ando Sakura), Juri (Sasaki Miyu), and Osamu (Lily Franky) play together in Shoplifters

of abduction or salvation? By not following the rules of an organized society, are they the ones who have wronged, or rather, are they the marginalized victims of a wronged system? Who has truly been "shoplifted"?

The typical American audience might need patience to sit through the measured film, but for those who do, they will be rewarded with a tale that is heart-wrenching and raw. Beautiful cinematography and natural performances by famed actors paint a masterpiece made up of delicate, brushstroke details, from moments to looks and soft touches to smiles. Shoplifters, unlike its titular connotation, is a film of compassion.

INTERVIEW

Professor Tod Machover talks Schoenberg, music, history, and going home

Last week, The Tech reviewed the opera Schoenberg in Hollywood, a passion project for Tod Machover, the Muriel R. Cooper Professor of Music and Media at the MIT Media Lab. Schoenberg in Hollywood premiered at the Emerson Paramount Center on Nov. 14, portraying the life of Arnold Schoenberg (Omar Ebrahim) after he escapes from Nazi Europe and arrives in Hollywood. The opera opens with his meeting with film director Irving Thalberg, but it breaks into a series of glimpses into Schoenberg's life story through the language of film, cycling through different film genres, sung and acted by Schoenberg's two music students (played by Sarah Womble and Jesse Darden).

In an interview with The Tech, Machover talks about Schoenberg's legacy and the challenges of adapting his life into an opera. He also recalls director Braham Murray, who passed away during the opera's production, and the work they accomplished together in the time they had.

The Tech: On the creative side, there's a lot of freedom to pick what you want to do and many ways of interpreting something. Was there a challenge of picking which parts of Schoenberg's life to include?

Machover: The first step, when I first thought of the project, was the scene with Thalberg and the idea of Schoenberg as the uncompromising, ornery, unpopular, and really important composer coming to Hollywood from Vienna where it snowed all the time and everybody frowns. He gets kicked out, and he ends up in a place where it's sunny, and everybody's in the movies and happy. You could make an entire opera completely about what happened in Hollywood. That was my original idea but then, the more I thought about [it], the more that seemed conventional.

It was interesting — there were these interesting characters; he was friends with Charlie Chaplin, played tennis with George Gershwin, lived across the street from Shirley Temple. The whole crux of it is: is he going to make this movie? Is he going to find a way to reconcile his uncompromising vision with popularity? And instead of asking that question over and over again, we decided to have him view his life through the language of the movies and, by definition, the contrast of what he lived through and what he felt. Imagining it in this context would show this contrast all the time. Part of the reason it's funny is most of these contrasts are impossible, but at the same time they kind of work. That's the point, there's no simple answer, but these forces are reconcilable. It'll be through glimpses and movie genres and sometimes there will be a real scene on stage.

We decided to have **Schoenberg view** his life through the language of the movies

That was around the time we brought in Simon Robson. I remember Braham [Murray] and I said to Simon, "Here's the structure - which looks pretty much like the structure we have now — and we'd like to have these scenes from Schoenberg's life; here are several biographies." Essentially, here is our wishlist, and could you come back with a possible outline? I knew that choosing the scenes was critical — it would determine the shape, the length - and what I was hoping for was that he'd come back with a complete outline. But Simon came back with several of the scenes, and said, "You know, my intuition as a writer is that if we accept this basic structure and you accept that these are the kinds of scenes I'll use — and I have your list of a whole bunch of scenes — I'd like to jump in and start writing." We said okay, and then he made a draft pretty quickly, which wasn't perfect, but it was remarkable. The full draft pretty much has the same shape as it does now, maybe missing some detail. We spent a lot of time fine-tuning the text in different ways, but that's when we figured out which scenes to have and which to not have.

The Tech: What do you think was the most challenging scene to translate into

Machover: In general, the most challenging thing was to represent something about Schoenberg as a musical character. I can introduce some of his music here and there, and I could introduce the feel and sound of his music without being literal, but [the challenge was] to do all of that in a context that is my music, not because I want to promote my music, but because that's where the continuity comes from and it's the musical story I want to tell.

So overall, that was the most challenging thing, and that has something to do with setting individual scenes. Musically, it's a very diverse opera. Each scene has quite a different feel and the opera is framed by the students and the meeting with Thalberg and the challenge to write music for movies, and then Schoenberg reflects on his own life through these movies. So both visually and musically, the opera goes through music history and then through Schoenberg's music history. He was born in 1874 and grew up during the late Romantic period when Wagner was the force that everyone had to deal with, the kind of full harmonic potential of Western music and the power that comes through traditional chords. Schoenberg and his whole generation thought that this language that started 100 years before Bach had been pushed as far as it could be pushed, and [the opera] picks up as he's grappling

I tried to find a way so that even though he was going through these styles, the actual melodies or something about the way the notes related to each other was continuous, that there was something holding it together. At a deeper level, I was really interested in not saying it explicitly but projecting it, that these underlying melodies and sounds are similar on some level.

What's important is what Schoenberg said, and what I also believe: that it's not the surface sound but what's being conveyed. I think it ties into the idea that what's shared between human beings is more powerful than what's different.

What's shared between human beings is more powerful than what's different

The Tech: It seems like the hardest part of being a composer is not the individual scenes but connecting all those scenes.

Machover: Right, and even though I didn't grow up particularly liking opera and I don't necessarily go to a lot of operas, I love words and I love text and I love the way words can focus your attention and your mind and your subconscious even when you're listening to music. And I really get inspired by words. It's incredibly hard work to write an opera but once we make the libretto, the libretto already has the individual scenes and the continuity and the shape. I work really hard to get the music just right, but the music comes to me pretty easily once I have the text.

Actually, there was a scene that was That was the scene that called, "Schoenberg Follies: A Bad Revue." In the original version of the libretto, there were these bad reviews read by his wife, some of these testimonials made by his students. They were very prosey and a very different character than the rest of the libretto, so I couldn't think of melodies for those. So I thought, okay, bad reviews, you just have to read them. The first version I made had a collage of Schoenberg's most famous pieces, including Pierrot Lunaire, the piece that premiered 1912. There was a riot and people beat each other up and so I used that as a collage in the background and people spoke these words over it. That didn't feel right. And then I did another version and I just couldn't figure out a way to make it work.

It was really late, like in July, and the orchestra was calling, so I set a week aside to figure out how to make this section work. Then Simon Robson, the librettist, sent me an email: "I know it's late, and I know you're under a lot of pressure, but I have a really different idea about that scene, and I just want to tell you that I think it should be a musical; what if it was like Singing in the Rain and you had a dance number at the same time?"

I wrote him back and said, "I don't have



Tod Machover, Muriel R. Cooper Professor of Music and Media at the MIT Media Lab, composed Schoenberg in Hollywood.

time, but you're right. This would really be fantastic, it's right in the middle of the opera." And he said, "I bet in a couple of days, I can write a totally new section."

He wrote a draft really quickly, and I immediately saw it was the right thing and got the basic musical idea. It was a case where it took a while to get the final form, but once we did, I wrote it really fast.

The Tech: Watching the opera felt like a meta-experience. We're watching people watching themselves on the film projected at the back while the actors are playing these roles on stage and seeing these multiple layers. How did you organize it so that it wasn't confusing, but it still had those layers?

Machover: In the very first version, there was a lot more going between live action and film, where you were watching only film. I looked at that version and I really wanted the focus to be on the live characters and whatever role the film plays - sometimes it's a background, sometimes you're watching, sometimes you're playing it - but I'm hoping that people are really following the characters on stage.

That took a lot of time. Even when the libretto was done, I think the question was what was exactly on stage. [This was] one of the reasons we started thinking about this particular form rather than a kaleidoscope of Schoenberg in Hollywood at Chaplin's dinner party. Braham [Murray] said the way for this opera to be really focused and successful was you've really got to care about Schoenberg as the central character and be with him all the time. If he's just a spectator and things are happening around him, or if he's just like a symbol, it won't hit and it won't mean anything. That was the guiding principle and after Simon started writing the first ten lines for Schoenberg, I could see that it was vivid and personal, and making sure Schoenberg was never just a spectator was one of the tricks.

The Tech: To an audience member, everything flows so naturally that you take it for granted. There are so many human elements. It's not like a movie; you have to control things live.

Machover: Yeah, that works by having a combination of things prepared ahead of time, things broken up into little bits, and things that go between sections so that they can actually morph. So something that can take whatever just happened and continue that for a second until the next thing is ready, so there's no break. All those little tricks you

The musical electronics work like that too. There are two keyboard players, one person who has a pretty difficult but traditional piano part. He plays on an acoustic piano and a synthesizer. Now the second player, just like Peter [Torpey, who cues up film projections], has cues and is setting off electronics that either we've prepared ahead of time or are designed to adapt to whatever the instruments are playing at that moment, to connect between two things.

Schoenberg realized that he needed to make something real happen

The Tech: And last question. I love iroshow "The End" and in the end, you show 'The Beginning." Who came up with this

Machover: That was the librettist, Simon. I think it was in that very first draft. He had this idea of every film, especially from the 30s and the 40s, having "The End," which you don't do anymore. And I don't know how he came up with that, but he thought of that convention at the end, and thought about this whole process of Schoenberg reliving his life and confronting this big challenge, and really thinks about what he does next. He ends up somewhere, ready to do something else, and he says, "Action!" as the last word. For me, the "Action!" means how to use his life and his music to change something in the world, not just to write his piece, but to use his life and music for something more than that. Which is ironic, because he ended up in L.A., far away from Europe where he was trying to stop the war and save the Jewish people but no one was listening to him or his music. But the fact that he realized that he needed to make something real happen and not quit is worth knowing about and following.

The interview has been edited and cut for clarity and length.

Eagles

Solution, page 3

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Solution, page 3

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Instructions: Fill in the grid so that each column, row, and 3 by 3 grid contains exactly one of each of the digits 1 through 9.

Detailed Duos by Pam A. Klawitter

Solution, page 3

ACROSS

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- 5 Sound in a stable 10 Spring time
- 13 Fun-run pace
- 14 Debussy's sea piece
- 15 Confront
- 16 Sort of solo
- 17 Preposterous
- 18 Former spouses
- 19 Paragon of virtue 22 Borden's cow
- 23 Kept on course
- 27 Actress Woodard
- 31 Unseen attraction
- 32 "Thursday Night" game
- 35 USDA diagram
- 38 Eventful periods 40 Flap in one's yap
- 41 Refrain snippet
- 42 Olympian ambition
- 45 FDR's domain circa 1931 46 One making introductions
- 47 Redmayne who was

- Hawking
- 49 Throws in the microwave
- 52 Happen next
- 56 Place of ultimate happiness
- 60 Be in sync
- 63 Low-tech hair dryer
- 64 Cruise stop 65 Love in Barcelona
- 66 Disney mermaid
- 67 Ankle neighbor
- 68 Came into
- 69 Expects the return of
- 70 Art on arms

DOWN

- 1 Where props are displayed
- 2 Harry Potter series owl
- 3 Labors long
- 4 Ballparks
- 5 Narrow cut
- 6 Family nickname
- 7 Arabian Sea sultanate
- 8 Tears apart 9 Pay for everyone

- 10 Hit the limit, with "out"
- 12 "By all means"
- 15 The __ City (what

- 24 Caesar subject
- 25 Post of etiquette
- 26 Tots' pops
- 28 Polo team complement

- 32 With less experience
- 33 Wharton title character
- 34 Timber tree
- 36 Trudge along
- 37 Lawn location
- 39 Surprising success

- 11 Old pro
- Washington called
- Washington) 20 Portraitist's subject, at times
- 21 Bring up

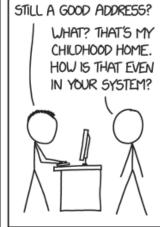
- 29 Wander around
- 30 Draw out

- 43 Highly prized 44 Subsided, with "down"
- 48 Get to volunteer
- 50 Final tally
- 13 16 17 18 19 20 22 23 25 | 26 28 | 29 | 30 32 | 33 | 34 35 38 42 43 46 49 50 51 52 56 57 | 58 | 59 60 | 61 | 62 63 65 66 67 68 69 70
- 51 Camper's confection
- 53 Obama daughter
- 54 Darkened
- 55 Idyllic locales 57 Victor's cry
- 58 Stuff that's sown 59 90-degree shapes
- 60 Binge
- 61 "If you ask me," in texts 62 Web-crawling software

[2075] Update Your Address







15 21 ASH TREE LANE

THE ADDRESS WE HAVE 15 205 SECOND ST #2. I ... THINK THAT'S WHERE MY PARENTS LIVED BEFORE I WAS BORN!?



ARE YOU STILL LIVING IN...THE AUSTRO-HUNGARIAN EMPIRE?" YOU KNOW WHAT, SURE.

AUSTRIA-HUNGARY DISSOLVED IN 1918. WELL, I COME FROM A



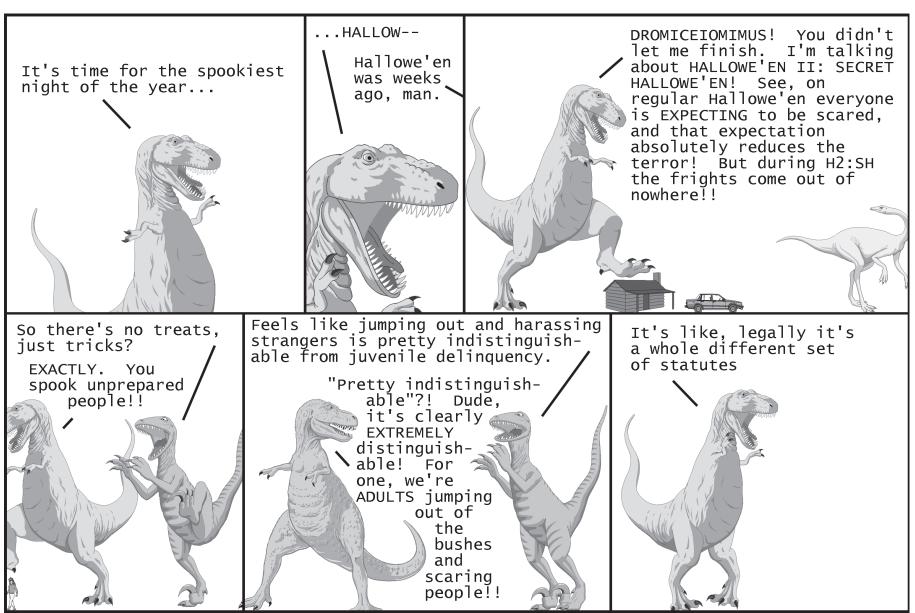
how to update it, but that sounds complicated.

This is my four-digit PIN. It was passed down to me by my father, and someday I will pass it on to you. Unless we figure out

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And the amygdala is responsible for FEAR RESPONSE!

by Ryan North

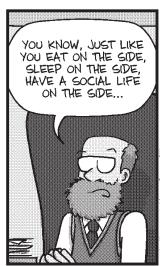




FUNFUNFUNFUNFUNF





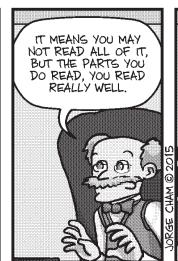




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Flyers Solution, page 3

2×	i	63×	i i	45×	i	384×	i i	i i
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		_	<u> </u>					-
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21+		 	 	5–	 	-		- 1
	1	1	1		1			
	<u>i</u>	<u>i</u>	i					

Instructions: Fill in the grid so that each column and row contains exactly one of each of the numbers 1–9. Follow the mathematical operations for each box.

Amoebas by Mehitabel Glenhaber





12 THE TECH
THURSDAY, NOVEMBER 29, 2018





[SPRING 2019]

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